Bandolier 115

Evidence-based thinking about health care

The problem with Friday

Bandolier hates Friday, because Friday is the day when the newspapers and television get hold of some piece of research to headline. Typically it will be one of two types.

The first is some incredibly early piece of research. An example would be that some gene is found linked to baldness or moustache-growing in Welshmen, and we then get quotes telling us how this breakthrough will make a huge difference for bald Welshmen with moustaches and will change their lives. Even if the example were not absurd, the delay between a research discovery and clinical use is substantial, usually measured in decades, as with monoclonal antibodies and TNF.

More irritating is the observational study linking moustache growing to baldness. More bald men have moustaches than men with full heads of hair. Clearly, growing a moustache makes your hair fall out. And then, when numerous experts have pontificated at length, and we are stimulated enough to get a copy of the paper and read it, we find that both of the bald men in the study had moustaches, and neither of the men who had a full head of hair. The numbers are so small that any conclusion is fatuous, before even getting to confounding and issues about causation.

This month *Bandolier* examines this latter phenomenon with two studies looking at coxibs and upper gastrointestinal bleeding in the real world. Both are big, and both are well done. But in one most patients were on coxibs, and in the other most were on NSAIDs. Numbers of events was small or very small, making interpretation problematical.

How are you feeling?

When you are young, have no medical complaints, and you take no medicines, you should be on top of the world. You certainly shouldn't have much in the way of symptoms or adverse events, because there is nothing for you to have an adverse event to.

Ah, if life were only so simple. In response to a reader's query, *Bandolier* has been looking at the rather limited literature on adverse nondrug events. There may be little literature, but there are a lot of events. Four out of five members of a population like that described above had at least one symptom over three days. That some were medical students and that the major complaint was fatigue is only a partial explanation.

Real world use of coxibs

Understandably makers of new products get very excited about them, and expect us to be as excited about the results of their clinical trials as they themselves are. If we were, we would be hopping around like frogs in a jam jar. Older and wiser heads ask about real world results, about what happens to the next ten treated rather than the NNT. What we want is some evidence that in the real world the new interventions work as well as they do in clinical trials. An important academic point this, too, because if the results were very different, we may have to re-think the way we do the trials.

For coxibs, persuasive evidence exists that they reduce gastrointestinal complications associated with older NSAIDs, without any loss of efficacy. The clinical trials showing this are large, and we have guidelines for treatment indicating that patients at higher risk of gastrointestinal problems with NSAIDs should be given coxibs. Now we have two real world observational studies [1,2] from Canada and the UK that appear to confirm the results of the randomised trials.

Studies

Canada

This was a population based retrospective study using databases with 1.3 million people aged 66 years or older in Ontario. It covered a period of one year from April 2000, the date on which coxibs became available for prescription. There is free access for prescriptions to all elderly people in Ontario.

People taking coxibs, non-selective NSAIDs and a random sample of 100,000 people were chosen (a general elderly population, not matched by age, or sex). The outcome chosen was admission to hospital for upper gastrointestinal

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haemorrhage using comprehensive linked databases. Users were defined as those who were given at least two successive prescriptions and who received enough drug for at least 30 days of observation.

UK

This study used the UK general practice research database of about 700 practices between 1987 and January 2001. A single cohort of 1.4 million users of NSAIDs or coxibs, with periods of exposure and non-exposure, were identified for every user. The outcome was gastrointestinal haemorrhage, melaena, or haematemesis.

Patient characteristics

Canada

Patients had an average age of 75 years. Users of NSAIDs and coxibs were different (Table 1) from controls.

- Compared with controls and NSAIDs, more coxib users were women (70% vs 60%).
- Compared with controls, users of NSAIDs (including diclofenac plus misoprostol) had more hospital admissions, a history of use of gastroprotective agents (GPA), use of opioid analgesics and used more aspirin.
- Compared with controls, users of coxibs had more hospital admissions, had a greater history of use of GPA, used more opioid analgesics, had a greater history of prior GI procedures, had a greater history of GI haemorrhage, used more aspirin, anticoagulants and proton pump inhibitors.
- Compared with NSAID users, users of coxibs had a greater history of prior GPA use, prior GI procedures and use of aspirin and proton pump inhibitors.

UK

Patients had an average age of 62 years. Users of NSAIDs and coxibs were different (Table 1).

- Compared with NSAID users coxib users had a more frequent history of prior use of gastroprotective agents (histamine antagonists and proton pump inhibitors, dyspepsia, and use of gastroduodenal agents).

Results

Canada

Users of coxibs outnumbered users of NSAIDs by 6 to 1 in numbers of users, and 10 to 1 in exposure. The number of admissions for gastrointestinal haemorrhage, patient years of exposure, and events per 1000 patient years are in Table 2. There were 187 events in total, nut only 17 (9%) were in patients using NSAIDs. Coxibs had about half the rate of admissions for gastrointestinal haemorrhage than for NSAIDs or diclofenac plus misoprostol.

For coxib users compared with NSAID users the relative risk was 0.4 (0.2 to 0.7). For diclofenac plus misoprostol users compared with NSAID users the relative risk was 0.8 (0.4 to 1.6).

UK

Users of NSAIDs had 400 times more exposure than those of coxibs. The number of cases of gastrointestinal haemor-

Table 1: Characteristics of patients included in studies from Canada and the UK

Canada	Controls	NSAID	Diclofenac + misoprostol	Coxib
Number	**100,000**	**5,391**	**5,087**	**33,491**
Hospital admission in last year	12	19	18	20
Use of GPA within 180 days	17	25	25	42
Use of opioid analgesics within 180 days	11	26	26	31
Prior GI procedure	18	20	21	32
Prior upper GI haemorrhage	1	1	1	3
Aspirin use	12	19	19	18
Anticoagulants	7	5	5	10
PPI	6	8	8	22
UK		**NSAID**	**Meloxicam**	**Coxib**
Number		**1,380,000**	**for all drugs combined**	
Use of GPA within 180 days		8	19	23
Any history of dyspepsia		6	13	17
History of gastroduodenal events		12	26	35
Anticoagulants		0.3	0.4	0.7
History of H2A use		15	35	42
History of PPI use		5	24	36

Table 2: Events, exposure, and event rates for upper gastrointestinal bleeding

Canada	Controls	NSAID	Diclofenac + misoprostol	Coxib
Admissions for upper gastrointestinal haemorrhage	82	17	13	75
Exposure (thousand patient years)	38	1.4	1.4	14.7
Number per 1000 person years	2.2	12.6	9.6	5.1
UK	**Not exposed**	**NSAID**	**Meloxicam**	**Coxib**
Gastrointestinal haemorrhage, melaena, or haemtemesis	5611	2875	36	4
Exposure (thousand patient years)	5816	628	7.1	1.6
Number per 1000 person years	1.0	4.6	5.1	2.6

rhage, melaena, or haemetemesis, patient years of exposure, and events per 1000 patient years are in Table 2. There were 8,526 events, of which 36 occurred with meloxicam and four with coxibs.

For coxib users compared with NSAID users the relative risk was 0.4 (0.1 to 0.97) after adjustment for covariates. For meloxicam users compared with NSAID users the relative risk was 0.8 (0.6 to 1.2).

Comment

These two examples provide some fertile territory for thinking about observational studies. Both studies were well done, used standard methods to capture lots of information, were population based, and were large, drawing on total populations of about 1.3 million people in each case. Both studies show pretty much the same result, confirming a lower rate of upper gastrointestinal bleeding with coxibs than with NSAIDs in a high-risk population.

While it is tempting to accept the results, at some point we have to compare and contrast the studies, and look at the numbers. The Canadian study covered the first year of coxib introduction. Of the 44,000 older people taking coxibs or NSAIDs, 76% were using coxibs, and as a result the number of events occurring in the much smaller proportion of people taking NSAIDs was low, at 17. The UK study covered a longer period of about 13 years, and 99% of the information concerned use of NSAIDs, with only a quarter of one percent of the information on coxibs, with only four actual events.

The Canadian study was good at measuring event rates with coxibs but not NSAIDs, and the UK study was good at measuring event rates with NSAIDs but not coxibs. It is tempting to put the two studies together, but different outcomes, patients, and time span make this problematical. The difference in rates of events in people not exposed (Table 2) is very considerable.

A minimum requirement?

Bandolier frequently gets cross at observational studies that seem to be important, but, on closer examination, have a very small number of events. It is possible to generate statistical significance with a small number of events. For instance if events occur in 3 of 30 people in one group but 10 of 30 in another, we have a result which is conventionally statistically significant. If we have one more event in the first group or one fewer in the latter, the result is not statistically significant.

We need some rules to help us here, because it isn't just the number of events that is important. The number of observations also contributes both to the statistical calculation and the weight we put on any result. Is there a minimum number of events that should be allowable in observational studies? ***Bandolier*** would love pointers from numerate readers.

We should all keep reminding ourselves that observational studies, powerful though they may be, tell us only about associations they find in the context of what they have examined. They do not prove cause and effect. And however well they are done, there is likely to be some elasticity in what is going on. In these particular studies, neither could absolutely guarantee that all events were captured, or that those captured were the events we want. So is four, or 17, the lower number of events in the studies, a number we can trust?

That's the problem. Just as we have clever people working on reporting guidelines for randomised trials and systematic reviews to help peer-reviewers, editors and readers, we need help in establishing guidelines for observational studies. Please put on the list the number of events that need to be observed for us to be sure that we can trust the result, and relieve our concern about findings being due just to the random play of chance.

References:

1 M Mamdani et al. Observational study of upper gastrointestinal haemorrhage in elderly patients given selective cyclo-oxygenase-2 inhibitors or conventional non-steroidal anti-inflammatory drugs. BMJ 2002 325: 624-629.

2 TM MacDonald et al. Channelling bias and the incidence of gastrointestinal haemorrhage in users of meloxicam, coxibs and older, non-specific non-steroidal anti-inflammatory drugs. Gut 2003 52: 1265-1270.

Planning for anti-TNF therapy

Bandolier 99 reported on the evidence about anti-tumour necrosis factor (TNF) antibody treatment for treatment of rheumatoid arthritis examined by the UK's National Institute for Clinical Excellence (NICE). NICE adopted the British Society of Rheumatology (BSR) guidelines for treatment of rheumatoid arthritis, that anti-TNF agents should be used if the following criteria were met:

- Patients satisfy ACR (American College of Rheumatology) classification for RA
- Patients have highly active RA
- Patients should have failed treatment on methotrexate and at least one other disease modifying agent
- Treated patients should be entered on a central register, with drugs, dose, outcomes and toxicity reported on a quarterly basis.

Treatment costs are presently about £8,000 a year, and there is clearly a budgetary impact involved in introducing the agents. But how many patients need to be treated, and how much needs to be budgeted to implement the NICE recommendations and to follow the BSR guidelines? A good study from the West Midlands [1] provides some useful figures.

Study

The West Midlands has 38 consultant rheumatologists in 14 centres serving 5.3 million people. In a two-week period in summer 2001, 12 centres and 32 consultants reviewed all patients attending outpatient clinics. A standard questionnaire was attached to notes for doctors or nurse specialists to complete. It confirmed that patients had rheumatoid arthritis according to ACR criteria, history of response to methotrexate and disease modifying drug (DMARD) use, and any contraindications to anti-TNF therapy. For those patients failing methotrexate and at least one DMARD, and with no contraindications, assessment of disease activity was made using painful and swollen joint counts, patient global assessment of disease activity and laboratory tests.

Results

Over the two weeks, 1,441 patients with RA were assessed. Their average age was 58 years and 72% were women. Three of the patients were already using anti-TNF therapy.

Table 1 shows the numbers and percentages of patients who met different criteria for possible anti-TNF use. Thus 233 patients failed methotrexate therapy because of adverse effects (61%) or lack of efficacy (31%), and 177 had also failed at least one other DMARD. Of this 177, 19 had a contraindication for anti-TNF use, and of the remaining 158, 80 (5.6%) had disease activity above the threshold for anti-TNF use.

There were thus 80 candidates for anti-TNF therapy, but only three patients actually receiving anti-TNF therapy. The use of additional criteria of failure of methotrexate, and two, three or more than three failed DMARDs, would reduce the numbers of candidates for anti-TNF therapy, with the most stringent criteria giving only 27 candidates (1.9%).

Comment

This is useful. When new guidelines are introduced, we need a handle on their impact, and this shows how information can be speedily collected. Yes, there is a necessary period of organisation, but having a group of clinics collecting information comprehensively over a short period minimises the duration of a study while maximising the number of patients studied. It also much reduces the likelihood of patients attending twice and being double counted. Here the participation of 12 of 14 centres, and the inclusion of nurse-led clinics meant that the information was comprehensive.

We can be fairly sure that about 6% of patients with rheumatoid arthritis attending rheumatology outpatient clinics in the UK will be candidates for anti-TNF treatment using NICE guidelines. That may be too much of a budgetary jump at one go, but we know that even if we restrict access for those who have failed more than three DMARDs, 2% of patients are still candidates. We have a series of bottom lines, each of which can come with budgetary requirements, and can apply it to our own area.

While this study was not designed to produce incidence or prevalence figures, the authors go one step further. Using some literature data and assuming that 80% of patients with rheumatoid arthritis attend hospital outpatient clinics, they arrived at an estimate of 36 patients eligible for anti-TNF therapy per 100,000 population.

Reference:
1 CS Yee et al. The prevalence of patients with rheumatoid arthritis in the West Midlands fulfilling the BSR criteria for anti-tumour necrosis factor therapy: an out-patient study. Rheumatology 2003 42: 856-859.

Table 1: Candidate rheumatoid arthritis patients for anti-TNF therapy, according to different criteria

Patients	Number	Percent
RA by ACR criteria	1441	100
Failed methotrexate therapy	233	16.2
Failed further DMARD therapy	177	12.3
No contraindication to anti-TNF therapy	158	11.0
Disease activity score above threshold for anti-TNF therapy	**80**	**5.6**
Additional criteria applied		
Failed methotrexate +2 or more DMARDs	62	4.3
Failed methotrexate +3 or more DMARDs	40	2.8
Failed methotrexate + more than 3 other DMARDs	27	1.9

ADVERSE NONDRUG REACTIONS

Adverse events is an interesting topic, particularly in relation to clinical trials, and how we interpret the results of clinical trials for clinical practice. Adverse events described in patient information leaflets with prescribed drugs can lead to some interesting discussions with patients, especially when comments of frequency or severity of the adverse event are missing, limited, or misunderstood.

In single dose trials, the way in which adverse event data are collected in clinical trials can affect how many adverse events are recorded, and the extent of any differences between active treatment and placebo [1]. In long duration trials, almost every patient will record at least one adverse event, and making sense of even common, reversible and minor adverse events is difficult. What we most want to know is how much ***more*** common an adverse event is with treatment.

When placebo is used in clinical trials and adverse events occur, all sorts of convoluted discussions take place about placebo "causing" adverse events. What we really need is some information about adverse event frequency in people not taking part in a trial and not on any drugs, as a background to inform our discussions and thinking. Despite this being obvious and important, ***Bandolier***, prompted by a reader, could find very little information. Only two [2, 3] studies seem to have measured adverse events in a population not in a trial and not on any drugs.

Studies

Both studies were retrospective questionnaires about the presence of symptoms often listed as adverse events of drugs. The first was conducted in medical and nonmedical people in Philadelphia in the late 1960s, and the second reproduced the study in medical students in Magdeburg thirty years later.

In both studies, subjects initially recruited were screened for any diseases or medicines being taken, and only those without disease and taking no medicines were asked to complete the symptom questionnaire. The exception was that oral contraceptives were allowed in the German study. Subjects were asked to record whether they had any of the listed symptoms in the three days before questioning.

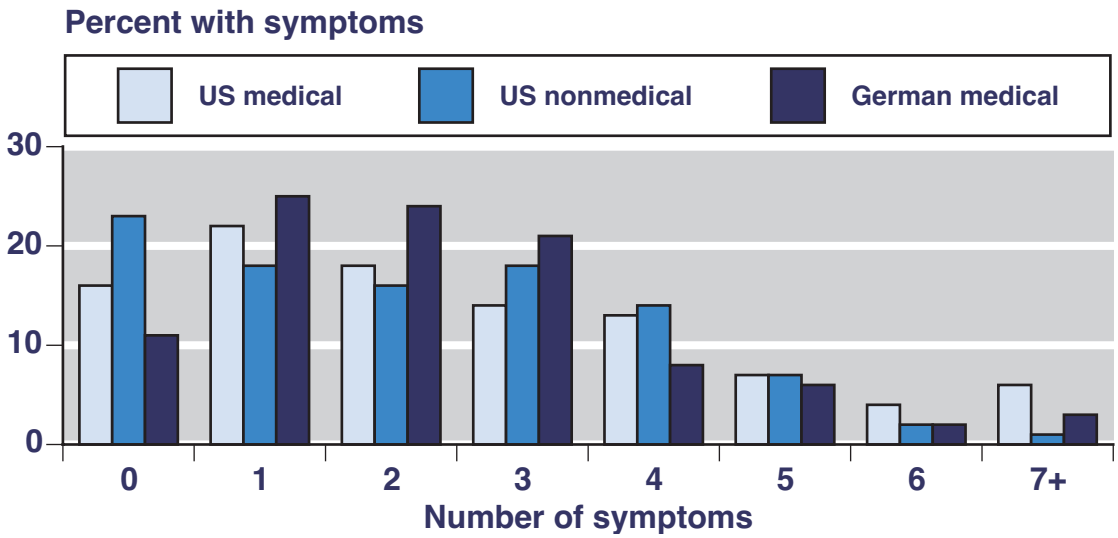
Results

Most people in the surveys were young and in their 20s. Adverse event reporting was common, and the list of adverse events and the frequency with which they were reported is shown in Table 1. Fatigue was the most common symptom noted in 40% or more, with nasal congestion, sleepiness, irritability, headaches and pain in muscles and joints occurring in 10% or more (Table 1). There were no major differences between medical and nonmedical subjects, nor between studies conducted 30 years apart.

Table 1: Presence of symptoms often listed as adverse events over previous three days in healthy, young, individuals in USA and Germany, 30 years apart

Symptom	Percent with symptom		
	US medical (n=239)	US nonmedical (n=175)	German medical students (n=130)
Fatigue	41	37	65
Nasal congestion	31	13	30
Inability to concentrate	25	27	13
Excessive sleepiness	23	23	8
Bleeding from gums after brushing teeth	21	20	15
Irritability	20	17	9
Headaches	15	13	25
Pain in muscles	10	11	13
Pain in joints	9	5	12
Skin rash	8	3	4
Bad dreams	8	3	4
Insomnia	7	10	8
Faintness of dizziness when first standing up	5	5	7
Urticaria	5	3	3
Dry mouth	5	3	5
Diarrhoea	5	2	2
Constipation	4	3	3
Loss of appetite	3	6	5
Palpitations	3	3	5
Bleeding or bruising	3	3	no data
Nausea	3	2	1
Fever	3	1	2
Giddiness or weakness	2	3	4
Excessive bleeding from gums after brushing teeth	1	1	no data
Vomiting	0	0	2

Figure 1: Frequency of reported symptoms



Over the 544 subjects in all three groups, 83% reported at least one symptom over the preceding three days, and only 17% reported none of these symptoms. Large percentages of subjects reported multiple symptoms (Figure 1).

Comment

What are we to make of this high level of adverse event reporting in young, healthy individuals? The results were consistent, but both studies used retrospective rather than prospective questioning. It might be conservative, since people taking analgesics or medicines for allergies were omitted.

Certainly it makes us look at clinical trial results with high levels of adverse events, but no difference between active and placebo, in a new light. It is what we should expect, and not necessarily a product of being in a trial. We might also wish to speculate about the results we would find in older, but fit populations, or populations that include people who do have disorders being treated.

Why did ***Bandolier*** find only two studies? It may be that our searching was badly flawed, and in that case we would love to be put right by informed readers telling us where we can find out more. But it may just be that there is not much there, which would make this a fertile research territory for young, aspiring, professionals.

References:
1 JE Edwards. Reporting of adverse effects in clinical trials should be improved. Lessons from acute postoperative pain. Journal of Pain and Symptom Management 1999 18:427-437.
2 MM Reidenberg, DT Lowenthal. Adverse nondrug reactions. New England Journal of Medicine 1968 279: 678-679.
3 FP Meyer et al. Adverse nondrug reactions: an update. Clinical Pharmacology and Therapeutics 1996 60: 347-352.

Reducing diagnostic tests in primary care

Bandolier has highlighted that ordering of many diagnostic tests is unnecessary and wasteful (***Bandolier*** 55), and that relatively simple strategies with information technology support can reduce unnecessary test ordering in primary care (***Bandolier*** 87). We now have a randomised trial in primary care which further supports the view that primary care can substantially reduce the ordering of tests [1].

Study

The setting was five regions of Holland where diagnostic centres serviced primary care physicians, where GPs can order tests without hospital referral. Between the five centres there were 37 local groups of GPs.

The intervention here was a multifaceted contact with GPs that included the following elements:

- Computerised feedback of ordering practice compared with colleagues.
- Dissemination of evidence-based guidelines.
- Regular small group meetings on quality improvement focusing on specific clinical problems and diagnostic tests used.
- Reminders about the problem of false-positive tests in low prevalence disorders (most positive tests will be false positives in this context).
- Discussion about how to deal with patient requests for unnecessary tests.
- Discussion about the difficulty of achieving change at the individual GP level.

Most of these discussions occurred in small groups of GPs supervised by the medical coordinator of the diagnostic centre. GPs then took the results of the discussions back to their practices with plans for implementation of guidelines and change at individual and group level.

Table 1: Tests monitored in the trial by condition

	Appropriate tests	Inappropriate tests
Cardiovascular	Cholesterol and subfractions, K, Na, creatinine, exercise ECG	Urea
Upper abdominal	SGPT, gamma-GT, ultrasound of hepatobiliary tract	SGOT, LDH, amylase, bilirubin, alkaline phosphatase
Lower abdominal	PSA, CRP, ultrasound of the kidney, IVP, double contrast barium enema, signoidoscopy	
COPD/asthma	Allergy screening, chest radiograph	IgE
Malaise, fatigue, vague complaints	ESR, Hb, Ht, TSH,monospot	Leucocyte count
Degenerative joint disease	ESR, uric acid, rheumatoid factors	Radiographs of lumbar or cervical spine, shoulder, knee or hip

The local group of primary care physicians formed the unit of randomisation. One group had a strategy related to cardiovascular and abdominal complaints, and the other had a strategy related to COPD and asthma, general malaise and fatigue, and degenerative joint disease. The conditions and associated tests are shown in Table 1. Each group acted as a control for the other, thereby balancing the influence on nonspecific effects related to actually being in a trial.

The outcome was the number of tests requested per physician over six months. Tests monitored for the study included simple and cheap laboratory tests (cholesterol, ESR, uric acid) and more complex and expensive tests (exercise ECG, ultrasound scan of the hepatobiliary tract, sigmoidoscopy and radiographs).

Results

Twenty-six groups with 174 GPs entered the study, with no differences between the them after randomisation. Fewer tests were ordered by GPs in intervention groups than in control groups (Table 2). All reductions in cardiovascular tests were statistically significant, but none of the changes for respiratory, malaise and joints tests were significant. The overall reduction was relatively modest, with savings of 67 and 28 tests per six months for each of the groups.

Comment

This is an interesting study. It is properly and cleverly designed and conducted, and shows that relatively straightforward education and management interventions can make a difference.

The interventions are not rocket science. They just asked GPs to look at guidelines and evidence, and discuss and plan together how they might overcome the difficulties in making change. The GPs were not told to make the change: rather they were invited to. A breath of fresh air, some may say, but actually just good management principles, using management in its real-world sense.

Despite this, some might question whether it was all worth it. ***Bandolier*** calculates the saving to be about 7,500 fewer tests per million population. No great shakes this in the vast scheme of things, but valuable nonetheless if some of those savings were for more complicated and expensive tests which might have long waiting times. And if the cost of each test was just £25 the savings would be getting on for £200,000 per million population per year.

Even so, the importance of the study is not the result, but the principle that relatively simple management interventions based on good evidence and good guidelines, implemented by GPs working together to find effective ways of implementation gets a job done. Might even be a way to run a complex organisation like a health service.

Reference:

1 WH Verstappen et al. Effect of a practice-based strategy on test ordering performance of primary care physicians. A randomised trial. JAMA 2003 289: 2407-2412.

Table 2: Results of using evidence and guidelines to target diagnostic tests in Holland

Tests	Percent change from baseline		Change in tests over six months
	Intervention	Control	
Cardiovascular and abdominal	**-12**	**0**	**-67**
Cardiovascular/hypertension	-6	+4	-35
Upper abdominal	-22	-9	-28
Lower abdominal	-10	+8	-5
Respiritory, malaise and joints	**-8**	**-3**	**-28**
COPD/asthma	-28	-20	-5
General complaints	-5	0	-19
Degenerative joint disorders	-19	-9	-3

All reductions in cardiovascular were statistically significant, but none of the changes for respiratory, malaise and joints were significant

Book reviews

The challenge for primary care. Nigel Starey. Radcliffe Medical Press, 2003. ISBN 1-85775-569-3. 240 pp £35 (www-radcliffe-oxford.com).

Many people in primary care might look at the title of this book and feel their eyes glaze over. Simply seeing "challenge" in the singular is likely to demand the riposte of which particular challenge of the many Nigel Starey wants to write about. They can be reassured that Starey, himself a GP with many years experience in primary care, is wise enough to know that there are times when the use of the singular is more emphatic than the use of the plural.

This book is about "management", but not the sterile management that makes us groan because it is obtuse and unhelpful, but which too often is the norm inside large organisations. Rather it is about clever thinking, about avoiding problems before they occur, about being ahead of the curve. It is about how to make the best of what we have inside the structure that we have now, or whatever other structure someone might impose, usually without any clear evidence that it will work better than what we have now.

In healthcare we often forget what management is really all about. Dictionary definitions iinclude "to succeed in achieving", and "to succeed with limited resources". To give him his due, Starey uses the "m" word sparingly, but the emphasis is on succeeding to achieve with limited resources.

Many examples throughout the book make excellent thinkpieces. Those concerned with repeat prescribing struck home. In one box the system is described as inefficient, time and energy consuming, designed to ensure that everyone will be unhappy most of the time. Later, a description of the pills needed by an 80-year old relate a need for five repeat prescriptions, ten trips to the surgery and five to the pharmacy. Nor is the human side overlooked, with patient and organisational perspectives balanced throughout.

The book has been written with knowledge, care, understanding, and with a degree of humanity not usually seen in a treatise on management. While its focus is on UK primary care structures, it is a worthwhile read in any healthcare context. In UK primary care, almost a must read.

Gawande A. Complications - A surgeon's notes on an imperfect science. London: Profile, 2002. £12.99

This is an intelligent and entertaining book by a trainee surgeon. Its provenance is probably Samuel Shem's House of God through ER, with the waspish insight of Asher. Just as ER uses cross-cutting plots here the chapters take in for example how a surgeon learns manual skills, and the problems of burn-out, obesity and even chronic pain.

Each chapter in the best American journalistic tradition tells a human interest story, and they are all credible, identifiable and accurate. The net result is that you romp through the book like a thriller with multiple plots, but behind most of the stories lie important thoughts, which linger intriguingly. No more perhaps than you would expect from a Rhodes Scholar with a Balliol PPE and Clinton administration background.

The book has three sections, fallibility, mystery, and uncertainty, and the structure hangs together. Early on he mentions the saying about surgeons "Sometimes wrong; never in doubt". He goes on to say that this is a strength, not a weakness, because uncertainties are part of the surgeon's life, with inadequate information, ambiguous science and imperfect knowledge and abilities. Yet the surgeon has to act. The best surgeons also know when not to act.

The public importance of uncertainty in medicine is that we rarely discuss it. In a culture of "I want it, I will go and get it", the very idea that you might suffer from a disease for which there is no fix is hard to swallow. In a scientifically illiterate media there is no room for critical appraisal of evidence. Gawande tackles the decision making at an individual level in the final chapter, the decision tree laced with unknowns when treating a woman with necrotising fasciitis, and I would love to read him on the public health aspects. He quotes David Eddy on the arbitrary nature of medical decision-making, but this is just one side of the coin. When the vociferous call is for patients to be involved in the decision-making little thought is given as to just how they are to be empowered to make the decisions. The reality for all of us is that the crucial decision when you need help is to choose the right professional.

The chapter "Education of a knife" tells the story of how he learnt to put in a central venous line, which involves sticking a big needle into a big vein, guessing where that vein is running beneath the skin. He writes beautifully about the anxiety and the politics of learning the manoeuvre. In a training culture of "see one, do one, teach one" he captures the anti-machismo of admitting defeat, sweat on brow and unwilling to stab the patient victim with ever increasing odds of failure. There is now an ultrasound technology to identify the target vein. Perhaps unsurprisingly there is a Luddite (and machismo?) tendency to damn the technology. Real men don't need the machine.

The burn-out chapter bears reading. In teaching, just as in medicine, we make little allowance for waning or changing interest, aptitude or even capability. There are rare individuals who want to carry on teaching or operating in the same way past fifty, and some have to, but we give little thought to the recognition of the waning appetite, and even less to how we change their commitments to everyone's benefit. This is a marvellous read, thought-provoking and entertaining.

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